

## PERSONAL PREPAREDNESS GUIDE

### PERSONAL PREPAREDNESS GUIDE BIOLOGICAL AGENTS: BOTULISM

#### What it is

Botulism is a muscle-paralyzing disease caused by a nerve toxin produced by a bacterium called *Clostridium botulinum*. Botulinum toxin in solution is colorless, odorless and, as far as is known, tasteless. Spores of *Clostridium botulinum* are found in the soil worldwide. The bacteria poses a major bioweapons threat because of its extreme potency and lethality; its ease of production, transport and misuse; and the potential need for prolonged intensive care in affected persons. Botulinum toxin is the single most poisonous substance known. There are three main types of botulism: infant, food-borne and wound.

Infant botulism occurs when living bacteria or the spores are ingested by an infant, and become planted in the infant's gastrointestinal tract. Honey and corn syrup, food products tolerated well by adults, have been associated with the disease in infants.

Food-borne botulism usually occurs when a person consumes food that has been improperly preserved or canned. Outbreaks from commercial products and foods prepared in restaurants have also occurred.

Wound botulism is caused by the growth of living botulism bacteria in a wound, with ongoing secretion of toxin that causes the paralytic illness. In the United States, this syndrome is seen almost exclusively in injecting drug users.

Although no instances of waterborne botulism have ever been reported, the potency of the toxin has led to speculation that it might be used to contaminate a municipal water supply. However, botulinum toxin is rapidly inactivated by standard water treatments such as chlorination and aeration. In addition, the slow turnover time of large-capacity reservoirs would require a comparably large amount of the toxin, which would be technically difficult to produce and deliver. Botulinum toxin cannot be spread from person to person.

**Symptoms:** Symptoms of exposure to the toxin may include blurred or double vision, drooping eyelids, slurred speech, difficulty swallowing, dry mouth and muscle weakness which always descends the body: first shoulders, then upper arms, lower arms, thighs, calves, etc. For food-borne botulism, symptoms begin from six hours to two weeks after eating toxin-containing food. Most commonly the delay is about 12 to 36 hours. Infants with botulism appear lethargic, feed poorly, are constipated and have a weak cry and muscle tone.

**Testing:** The most common tests given to determine the presence of botulism are taking a stool sample and a blood test to locate any trace of the toxin. Sometimes an analysis of food that a person has consumed is performed as well.

**Prevention/Treatment:** To prevent infant botulism, it is recommended that honey and corn syrup not be fed to infants less than 1 year old. Because high temperatures destroy the botulism toxin, persons who eat home-canned foods should consider boiling the food for 10 minutes before eating it to ensure safety. Any food that has a foul odor should not be opened or consumed.

A person suffering from respiratory failure or paralysis may require being on a ventilator for weeks, plus intensive medical and nursing care. The paralysis slowly improves, usually over several weeks. If diagnosed early, food-borne and wound botulism can be treated with an antitoxin from horse serum that blocks the action of toxin circulating in the blood. That can prevent the patient from worsening, but recovery may still take many weeks.

**Recovery Potential:** With prompt medical treatment, the risk of death can be significantly reduced. Most paralysis slowly goes away with time and treatment. The length and intensity of treatment varies for each individual based on the amount of toxin one has been infected with. In some cases, a victim may have to go through several months of therapy and remain on respirators.

**Environmental Clean Up:** If botulism is suspected, medical care should be sought immediately. If botulism is detected, public health agencies will investigate, obtain antitoxin if necessary and determine if a commercial product was involved. If used as a biological weapon, the results could be extremely dangerous.

The information was compiled from the following sources:

Botulinum Toxin as a Biological Weapon

<http://jama.ama-assn.org/issues/v285n8/full/jst00017.html>

Botulinum Toxin

<http://www.hopkins-biodefense.org/pages/agents/agentbotox.html>

NIH

<http://www.nlm.nih.gov/medlineplus/botulism.html>

<http://www.nlm.nih.gov/medlineplus/ency/article/001384.htm>

Michigan Department of Community Health

<http://www.michigan.gov/mdch/1,1607,7-132-2945-12994--,00.html#Botulism>

CDC

[http://www.cdc.gov/ncidod/dbmd/diseaseinfo/botulism\\_g.htm#How%20is%20botulism%20diagnosed](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/botulism_g.htm#How%20is%20botulism%20diagnosed)

<http://www.bt.cdc.gov/DocumentsApp/FactSheet/Botulism/about.asp>

Virginia Department of Health

<http://www.vdh.state.va.us/epi/botuf.htm>

Johns Hopkins

<http://www.hopkins-biodefense.org/pages/agents/agentbotox.html>